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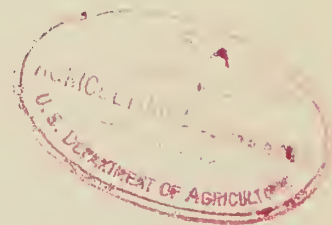
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LIVESTOCK SCALES AND WEIGHING

Information and Comments for
Market Supervisors Under the
Packers and Stockyards Act



By F. W. Miller, In Charge,
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The great bulk of livestock that is bought and sold at stockyards subject to the provisions of the Packers and Stockyards Act is sold by weight. The sales are usually made on the basis of an agreed price per pound or hundredweight and the money received by producers and shippers is determined by multiplying the weight by the agreed price.

The weight obtained for livestock is therefore of fundamental importance and is just as much a factor in the money paid for the livestock as is the price. Accurate weights are consequently of prime importance and can be obtained under ordinary stockyard operating conditions. It is important that supervisors and operators of posted stockyards and producers who patronize them have an understanding of the weighing processes so that they may aid in establishing and maintaining proper conditions.

In order to obtain accurate weights for livestock, three things are essential. The scales must be suitable, must be accurate and must be properly used. The purpose of the following discussion is to set out in general terms for the information of supervisors primarily, as well as of operators of posted stockyards, the essentials of livestock weighing. An attempt has been made to avoid technical discussions insofar as possible. Many of the most important matters to be kept in mind and observed are relatively simple. A careful review and study of this material should enable supervisors to familiarize themselves with the outstanding features of scale maintenance and operation which have a bearing on the accuracy of the weights obtained over scales at posted yards.

WEIGHMASTERS

The human element is of utmost importance in the weighing of livestock. It is of little use to expend much time and money in putting a scale into an accurate mechanical condition and then have the work undone by weighers who either do not understand their job or who are careless, indifferent, or have been influenced to give inaccurate weights. Therefore, considerable emphasis is being placed on this subject so that supervisors will realize its importance and will at all times endeavor to acquaint the weighers with the fundamentals of proper weighing. If in any case it seems that such efforts are not successful in bringing about the desired results, then steps should be taken with the operators of the stockyard to see that weighers are employed who are properly informed and who will follow instructions with reference to proper weighing procedures.

Regardless of the time and money spent in making tests to insure accuracy and perfect mechanical condition in a scale, it is obvious that a weigher operating a scale who is either ignorant, careless, improperly influenced, or dishonest can in a moment, through faulty operation of the scale, undo all that has been done to make the scale an accurate and reliable weighing instrument. It, therefore, is important that supervisors recognize the need for close observation of weighing operations for the purpose of detecting on the part of weighers a lack of knowledge, of the ordinary rules for handling the scale, or carelessness, improper influence, or dishonesty which might be reflected in the manner in which the weigher conducts his work.

There should be no secrecy surrounding the weighing of livestock at stockyards posted under the Packers and Stockyards Act. It is obviously the duty of the weigher to perform his work in such a manner as to get accurate, impartial weights at all times. This should be done regardless of the views of sellers or buyers or others who may be interested in the purchase and sale of livestock. The weighing operations should be carried on openly so that all who wish to do so shall have a full opportunity to see what is going on. It is recognized that when receipts are heavy and business is rushing the weigher of necessity performs his work rapidly, but it is paramount that accuracy and carefulness in weighing should not be sacrificed for speed.

Weighers should be so situated as to face the beam and the scale platform with their backs toward the scale house. They should at all times be in a position to observe both the drive-on and drive-off ends of the scale platform in order to see that no persons are leaning on the gates, that the gates are properly closed, and that the scale platform is clear of all conditions which would tend to interfere with obtaining an accurate weight.

For various reasons and at various times, weighers are subjected to pressure to induce them to weigh livestock at less than its true weight. At times buyers desire to keep their costs down, and at other times various persons are interested in having livestock show as high dressing yields as

possible. All of these matters should be carefully observed by supervisors with a view to correcting any conditions which tend to influence weighmasters improperly in the operation of the scales.

BALANCING THE SCALES

One of the important features in determining whether the weighing is being done right is to see that the scale is properly balanced. This simply means that when all the poises of the beam are set at zero, and the platform of the scale is empty, the beam should swing evenly and freely between the top and bottom of the loop in which the free end of the beam is situated. When the motion of the beam under these conditions slows down, it should come to rest approximately in the middle of this loop.

If the beam is out of balance, this is remedied by adjustment of the balance ball but this should be done only when it is necessary to bring the beam into correct balance. If the balance ball is moved during the weighing or when the poises on the beam are not set at the zero mark, there will be irregularities and inaccuracies in the weights indicated by the scale.

At times, because of wear or alterations in the beam, the poises can pass back of the zero marks at the left-hand end of the beam. In such cases, it may appear that the poises are in a proper position to obtain a balance on an empty scale but the result will be that the weight subsequently obtained for livestock weighed on the scale will be less than it would have been had the poise been properly set at the zero point. In some cases, this may amount to as much as 5 or 10 pounds on the small or fractional poise and considerably more on the main or large poise on the beam. This is, therefore, an important point to watch for when observing and supervising the weighing operations.

In ascertaining the balance on an empty scale, a weigher, even if familiar with the operation of the scale, must allow the beam to swing up and down at least once, and more times if necessary. If the beam is sensitive and there is little friction, the swinging motion of the beam will be steady. It will be properly balanced when released at the bottom of the loop if it swings upward and almost touches the top of the loop, clearing the top by approximately $1/16$ to $1/32$ of an inch, and then swings back to within $1/8$ or $1/16$ inch of the bottom of the loop. As a rule, if the beam does not touch the top of the loop and fails to come within $1/4$ inch of the bottom on its return downward swing, there is too much friction in the scale. Where there is little friction, the beam will swing in the loop for some time until it gradually dies down and comes to rest in the middle of the loop. Where friction is excessive, the beam will not swing as freely and will come to rest more rapidly.

Many weighers, who are reliable and competent, can by proper attention prevent friction from developing in the scale. But some weighers will continue to use a beam where quite obviously considerable friction is present. This friction tends to create inaccuracies in the weights and is a means of covering up irregularities which may be present in the weighing. Therefore it is important to see that the weigher balances the scale by adjusting

the balance ball carefully and allowing the beam to swing at least one full movement up and down. In this way, the balancing of the scale will be apparent to any observer in such a manner that he can note any friction present and the character of the beam action.

When livestock is being weighed on a scale, the weigher should get the same even center balance he attempts to get when he is balancing the empty scale. Beams equipped with type-registering devices are such that it is not always possible to get an exact center balance. In such cases, the weigher should favor neither buyer nor seller. He should endeavor to set the poise so as to get as near to a center balance as possible on this type of scale. At times, the balance of the beam under such conditions may be slightly low and at times slightly high. However, these conditions tend to be offsetting. If there is dissatisfaction on the part of buyers and sellers with this situation, the only remedy would be to have a beam put on the scale on which there are smaller minimum graduations. In other words, if the minimum graduations on the beam are 5 pounds, it would be necessary in order to get a more exact center balance to have a beam with graduations of 2 pounds or less.

In determining when the beam has reached the nearest point to a center balance when livestock is being weighed, the weigher should allow the beam to make a complete swing from bottom toward the top of the loop, or from top toward bottom, before the balance is accepted as being correct. This will enable any interested party to note the balance at any given time. After the balance has been determined, the weigher should immediately record the weight indicated on the beam either by impressing the weight on a ticket, if there is a type-registering device, or by recording it in an appropriate book in the absence of such device. The various controls and knobs on the poises or any other part of the scale which may affect the weight indicated by the beam should not be touched until the weight has been recorded.

It may be observed at times that in weighing livestock the weighmaster balances the beam at a low point in the loop when the scale is empty, and, at a high point when livestock is being weighed. The result is to show less weight for the livestock than would be the case if the scale were properly balanced when empty and when loaded. The amount of weight in each case may be small but in the aggregate will add up to a considerable figure. For this reason, supervisors should use care to see that weighers at all times follow the proper procedure in determining the balance of the scale.

Frequency of Balancing

The frequency with which a scale should be balanced between weighings depends on the condition of the scale itself, on the number and condition of the livestock weighed over it, and on the local surroundings and weather conditions. In general, it may be said that it is incumbent on the weighmaster to see that his scale is kept in proper balance at all times. In some cases the scale is balanced after every draft, and in others after several drafts or at intervals of 15 to 20 minutes. In any case, the time of taking the balance should be indicated on the next scale ticket used.

Balance Indicators

There has recently come into use devices known as "balance indicators." These are attached to the beams of the scales and the position of the balance of the beam is shown by the movement of the pointer against an index mark on the balance device. The device is constructed so that the pointer comes to rest quickly and the balance is read from the pointer when it is stationary. In general, if the balance indicators used on a scale are suitable, a change of $3 \frac{1}{2}$ pounds on the platform should cause a movement in the position of the pointer of approximately $\frac{1}{4}$ of an inch. These balance-indicator devices, when properly installed and maintained, are helpful in that they enable the ordinary layman, not familiar with the proper method of balancing or behavior of the beam, to determine when the beam is in balance. Their use should be encouraged for this reason.

TYPE-REGISTERING BEAMS

The use of a type-registering beam is desirable as it tends to avoid clerical errors, which may occur either intentionally or by mistakes in reading the weight on the beam and transcribing it in a book or on a scale ticket by means of a pencil. The use of a type-registering beam is not in and of itself a guarantee of an accurate weight. This can be accomplished only by proper weighing practices on the part of the weigher together with adequate testing and maintenance of the scale itself.

These type-registering devices on beams require close attention. Their purpose is served only when they give clear, legible, and correct numbers on the scale tickets. The weighmaster should be on the alert to detect imperfections in them, and they should report such conditions immediately so they can be corrected. This is a matter requiring constant attention and supervisors would do well to check over scale tickets from time to time as a routine matter in order to determine whether the type-registering device is operating properly.

Care of Beams

The beams of scales should be handled with care for their accuracy depends on certain mechanical conditions being maintained with considerable precision. A small amount of wear in the notches on the beam or in the knife edges on which it rests, or an alteration of the weight of the poise by even a small amount will bring about an inaccurate condition in the scale. Therefore, weighers who are observed to handle beams in a rough manner should be warned against this practice because it will bring about a rapid change in the beam and will result in inaccuracies in the weights.

RECORDING WEIGHTS

The weight to be recorded in any event is the true indicated weight on the scale without any allowance for shrinkage, dockage, or other differences. In this connection, it should be kept clearly in mind that in the

case of a type-registering beam the weight impressed on the ticket is intended to represent the actual weight of the livestock on the scale at the time.

Scale Tickets

Weights should not be impressed on scale tickets when livestock has not actually been weighed. A ticket impressed with the type-registering device which does not represent a bona fide weighing may be used in a fraudulent manner, and therefore marking tickets in this manner should not be permitted.

Scale tickets should be numbered and used in consecutive order. In the event of error or damage making them unfit for regular use, they should be marked void and retained as a part of the permanent weight records.

In all instances where regular scale tickets are used in making catch weights, the face of the ticket should be plainly marked with the words "catch weight."

Scale Ticket Material

Another important point with respect to the use of type-registering devices is that the scale tickets be made of the proper material. The National Bureau of Standards has published specifications for scale tickets to be used in type-registering beams and these should be followed by stockyard companies when ordering supplies of tickets. These specifications will be found in Bureau of Standards Letter Circular 127 entitled "Tickets for Type Registering Weigh Beams." These tickets have a blotter back which is important for two reasons; first, the type impressions are rendered clear by the indentation of the type on the blotter back, and second, the wear of the beam and damage to the type and the registering device are very much reduced.

Stockyard operators desire to give their patrons the best possible services. Weighing of livestock is one of the services whose importance to the patrons is obvious. It should go without saying that the operators of the yards will be zealous in their efforts to keep this service at a high standard. Supervisors can and should aid materially in this by working with the operators and their employees along the lines above mentioned.

TESTING SCALES

The Purpose of Tests

The purpose of testing a scale is to determine whether it has been weighing accurately under the conditions which represent its regular use. Therefore, with the exception of cleaning off the scale platform, the scale should be tested as found, and no change should be made in any part of the scale immediately before it is tested. Any other cleaning or alteration may affect the results of the tests in such a way as to make them of little

value or lead to a conclusion that the scale has been accurate as used, when the contrary may be true.

Scales at stockyards are used for weighing from one to a large number of animals per draft. When the animals are driven on the scale, depending on the number, they may stand at either end of the platform or in the center, or if there is a large number of animals they may be distributed over the entire scale platform. For this reason it is necessary, in order to insure whether the scale is accurate under various conditions, to test the scale up to the maximum load weighed on it and also to test it by placing the test weights at various positions on the scale platform.

It is also necessary that each part of the scale, such as the main lever, the large beam poise, the notches in the beam, and the counterpoise weight, be individually tested as they separately affect the weight indicated by the scale. Some scales of the older type have loose counterpoise weights hung on the end of the beam. In such cases, the counterpoise weights should be tested against standard weights, and the scale itself should be tested with standard counterpoise weights supplied by the testing agency.

Frequency

The frequency with which a livestock scale should be tested is dependent upon the amount and kind of usage to which it is subjected and the condition of the scale itself, but under no circumstances should it be tested less than twice annually.

Manner of Conducting Tests

In conducting a test on a typical livestock scale equipped with a type-registering beam, the procedure described below should be followed:

The scale platform is cleaned of debris and foreign matter in order that the test weights will not be soiled and that any change in the weight of the platform during the test, due to evaporation or other cause, will be reduced to a minimum.

After the platform of the scale has been cleaned and the gates leading on and off the scale are clear and beam poises have all been set at their zero position, 25 pounds of small assorted test weights known as correction weights, are placed on the platform. The balance of the beam is then carefully adjusted until an exact center balance is obtained. The balance ball should not again be touched during the remainder of the test.

After the scale has been accurately balanced, the SR at zero load is obtained and recorded. Following this, the fractional poise on the beam is first tested. This is done by setting it to read at its capacity which is generally 95 pounds and then applying the test weights. The poise is then returned to its zero notch, and next the intermediate fractional poise, if there is one on the scale, is tested at its various settings up to its capacity, after which the poise is returned to its zero point. When the

fractional poises have been tested in this manner and returned to their zero notches, they must be kept in that position during the remainder of the test.

After the fractional poises and the first or main notch of the beam have been tested, the test weights are removed from the scale platform and the empty scale is then balanced. If there has been any change in the balance, this is corrected by adding to or taking from the 25 pounds of correction weights on the scale platform. The amount of correction weights required on the platform to bring the scale into balance is noted on the test report as a basis for determining the amount of errors in the following steps of the test.

These correction weights form the basis for determining errors until a subsequent check indicates that a different amount of correction weights is required to balance the empty scale. For example, the scale may dry out to an extent where there is a loss of one pound in weight, in which case 26 pounds of correction weights would be required to balance the scale. If this happens, the new value, that is 26 pounds, becomes the basis for determining subsequent errors until a new determination of the balance of the scale is made.

The test weights are then applied, for example, 1,000 pounds, and the poise is set so that the reading of the beam corresponds to the amount of the test weights, which in this illustration would be 1,000 pounds. The beam is then brought to a perfect center balance by adding to or taking from the correction weights on the scale platform. The amount of weights removed or added will accurately show the error in the scale. In determining the error, the person operating the beam should not be informed of the total amount of correction weights on the platform until a satisfactory balance has been completed and accepted. In this way, each notch of that portion of the beam most frequently used should be tested individually since each is independent of the other and might have an individual error. Above the point of frequent usage only the major notches need be tested.

This phase of the test is carried out to the maximum drafts weighed over the scale. The SR is then determined for the scale with the maximum distributed test load on the platform.

The test weights are then removed from the platform and the empty scale is balanced by adjusting the small weights to bring the beam into the position of balance. The amount of weight required to do this is shown on the test report as a basis for determining errors in subsequent steps of the test. Any change in the balance of the scale thus ascertained is noted on the test report.

The individual main levers of the scale are next tested by applying a heavy test load over each supporting main lever knife edge and noting the errors on the test report. The errors for the individual levers should be compared with the error found in the same load when the beam notch was tested as heretofore set out.

When the corner tests are completed, the test weights are removed from the scale and the balance is again checked.

In carrying out the test as above outlined, it is important that the scale first be tested by a distribution of the test weights over the platform before the corner tests are made. If this is not done, errors appearing in the corners may lead the scale-testing agency to make alterations in the scale, sometimes of a minor nature, but this may cause large errors which have been affecting the weighing up of the livestock to disappear and then regardless of the fact that the scale test may indicate an accurate condition this is not an assurance that the scale has actually been weighing accurately.

ALLOWABLE ERRORS

The scale is considered accurate when the errors disclosed by the test do not exceed certain amounts called tolerances. Except as stated below, the errors in livestock scales should not exceed a pound and a half per 1,000 pounds of test weights applied. For example, with 10,000 pounds of standard test weights on the platform, the scale should indicate a weight of not more than 15 pounds above 10,000 pounds, or a similar amount under 10,000 pounds. For test loads of 1,000 pounds and less, an error of one pound is allowed for scales of 10,000 pounds' capacity, and an error of two pounds is allowed for scales of a capacity greater than 10,000 pounds. This is because it becomes impracticable to apply tolerances below a certain figure depending on the size of the scale.

In reporting the results of tests, these tolerances or allowable errors are ordinarily designated by plus and minus signs. When on test a scale shows more weight than is actually present on the platform, the scale is said to be fast and the error is designated by a plus sign. When the weight indicated is less than is actually present on the platform, the scale is said to be slow and the error is designated by a minus sign.

Scales are ordinarily found to have various degrees of sensitiveness. A properly working scale is a very sensitive mechanism, and even a scale of large capacity may show a definite response when only a few ounces of weight are added to or removed from the scale platform. It is often assumed, and quite naturally, that the sensitivity of a scale is an indication that it is accurate, but this is in fact incorrect. Sensitiveness and accuracy are independent. In other words, a scale may be very sensitive in its reaction to weights placed on the platform and yet show large errors in the test.

THE SR OF THE SCALE

The words "sensitive" and "insensitive" are used in scale-testing work as an indication of the response of the scale to a small change in the weight or load placed on the platform. In practice, the characteristic

of a scale used to describe and measure this feature is called the "sensitivity reciprocal" of the scale, and, for purposes of abbreviation, it is generally both called and written as "SR." Thus the symbol "SR" as applied to a scale simply means the change of weight on a scale platform required to change the balance position of the beam from the middle to the top or bottom of the loop.

In a scale which is well constructed and in good condition, the SR will not change greatly with the amount of weight or load on the scale platform. It may either increase or decrease slightly as the load increases.

In testing a scale, the determination of the SR is important because rusting or dulling of the knife edges or cutting of the bearings against which the knife edges rest, or because of binds and interference and other defects, some of which may occur without warning and which jeopardize the accuracy of the scale, often affect the SR of the scale.

It is important that supervisors be familiar with the SR of scales, which should not exceed twice the amount of the minimum beam graduation. For example, the SR of a scale with a 5-pound beam graduation should not exceed 10 pounds. There is a method for roughly determining the SR which is of considerable practical value for reasons which have just been recited. This is to balance the beam in the center of the loop, and then ascertain the increase or decrease necessary in the indication of the fractional poise of the beam to cause it to balance at the top or bottom of the loop. This requires no equipment and can be carried out with any quiet load on the scale platform. Although not as accurate as the method of using small weights on the scale platform, it is of every day service in scale maintenance.

REPORTING SCALE TESTS AND INSPECTIONS

Form P&S-10 for reporting tests of livestock scales under the Packers and Stockyards Act is designed to provide a record showing the detailed steps of the test. After the scale-testing agency becomes familiar with the form, it will be found simple to use and the entries can be made without confusion or difficulty. Great care should be exercised to see that all essential information is entered on the report form at the time the test is being made so that the record will be complete in every particular.

After the test of the scale is completed, the scale is then inspected and any errors found during the test which exceed the allowable errors or tolerances are corrected. In many instances, the corrections are made by adjustments of various parts of the scale, but in this respect some scale-testing agencies use methods of their own in correcting these errors which are rather difficult to describe in written reports. There is, therefore, no requirement that the details of the adjustments made on the scales be set forth in the report. However, the final test showing that the scale is accurate should be carried out in the prescribed manner so that the record will show that the work has been properly completed.

Reports of scale tests should be made in triplicate. It is intended that one copy of the report shall be kept by the stockyard company, one by the scale-testing agency, and the third for the files of the supervisor in charge of the particular market at which the scales are located. In all instances, the Washington office should be notified promptly of the dates on which the tests were made, or any unsatisfactory conditions which were found, and a statement that these conditions have been corrected or, if not, what arrangements have been made for their correction.

There is also provided P.S. Form 14 (Revised) for reporting the conditions found on the inspection of scales by the scale-testing agency. This inspection is to a certain extent a technical proceeding. However, with some experience and familiarity with scales, supervisors can follow these inspections and recognize in most instances the existence of unsatisfactory conditions. The inspection report itself sets out rather clearly the more important aspects of the scale construction which should be observed in order to determine whether the scale is in good working mechanical condition. These reports are to be executed at the time the scales are inspected following their test, and are to be handled in the same manner as the reports covering the scale tests.

TYPES OF SCALES AND INSTALLATIONS

Supervisors may from time to time receive inquiries as to just what kind of scale is best suited for weighing livestock. It therefore seems desirable to outline in as simple and non-technical terms as possible the kind of scales and the principal points relating to their installation which have been found by experience to meet most successfully the need for obtaining accurate weights for livestock under practical operating conditions at post stockyards. Inquiries of a special or technical character may be referred to the Washington office or to weight supervisors for consideration.

Types of Scales

Scales used for weighing livestock should not be unnecessarily large. The best arrangement consists of a small scale for weighing small drafts and single heads of livestock and a larger scale alongside the small one for weighing large or carload drafts.

At smaller yards, one scale is often used for all of the weighing. In such case, a fair compromise between the requirements for weighing single heads and larger drafts of livestock is obtained in a scale of about 16,000 pounds capacity with a platform about 16 by 9 feet. Many stockyards depend mainly for their receipts upon trucks in which the consignment is generally of small size. When large drafts are necessary, they are usually divided so as to keep each draft within the capacity of the scale.

The minimum subdivision of the weighbeam should not be less than five pounds, and the beam should not exceed greatly the weighing capacity

of the scale platform. The weighbeam should be what is known as a type-registering beam. These are devised so that the full weighing capacity is provided by the beam without the use of loose counterpoise weights. The beam and mechanism of the poise are such that a suitable scale ticket may be inserted in a slot in the poise and a type impression of the weight will be indented on the ticket by the operation of a handle on the poise. This device avoids clerical errors in reading the beam or recording the weight.

Type-registering beams are standard equipment for modern livestock scales and are recommended. The older types of beams with loose counterpoise weights are found only infrequently. Beams with tare bars are not suitable for livestock scales as they facilitate errors and fraud.

In the best constructed scales for heavy service at busy markets, the platforms are made of reinforced concrete carried on steel frames. Concrete platforms are heavy and accordingly the scale levers, knife edges, and other scale parts must be designed to carry a heavy load.

The design of the levers, knife edges, bearings, etc. should be such that the working parts can be readily examined, and the knife edges and bearings can be inspected easily throughout their length of contact.

The main-bearing assembly of the scales which connects the platform with the knife edges of the supporting main levers should be of such design that sidewise movements of the platform will be taken up by pivoted link elements or similar devices. This will reduce the tendency to displace the main-load bearing blocks on the main-load knife edges which might otherwise occur on account of animals moving about on the scale platform.

Scales of the pitless type are unreliable and are not suitable for weighing livestock at posted yards.

Installation

The beam should be placed in a window of the scale house so arranged that the weigher will sit facing the beam and scale platform and have a clear view of the scale platform, gates, and approaches through large, well-designed windows.

Ample natural and artificial lighting for the beam and scale office should be provided.

The weigher's space should be designed so that persons entering the scale house can observe fully the weighing in all of its details without interfering with the weigher's operations. The weigher's space should be railed or screened off from the remainder of the scale house.

The livestock-scale platform should be dirt- and water-tight. The surface of the platform should be level with the top of the surrounding

concrete pit wall, and the approaches and lead-off should be level with the platform.

Wooden-scale platforms should be constructed on steel frames because wooden frames are a constant source of errors arising from changes in the timber.

The clearance between the scale platform and the coping or inner edge of the scale pit wall should be $\frac{3}{4}$ inch to one inch at the ends for small and large scales respectively, and from $\frac{1}{2}$ to $\frac{3}{4}$ inches at the sides.

The gates should be at the ends of the scale and open the full width of the platform. They should clear by a generous amount when passing over any scale pit wall or approach as they are opened and closed.

The stock rack should be constructed on the scale platform. At the sides, the rack should be provided with a board six or more inches high, fitting snugly at the bottom with the scale platform to prevent dirt, etc. from working over and getting into the side clearances of the scale platform.

The surface of wooden platforms should be provided with cleats or removable frames designed to prevent the animals from slipping, and concrete platforms should be roughened for the same purpose.

The scale levers beneath the scale platform should be installed in a concrete pit at least six feet deep, and the levers carried on suitable concrete foundation piers.

The pit should be provided with a drain, water proofing, or whatever is required to keep it dry, according to the conditions present at a particular yard.

The pit of a modern scale is entered by a concrete stairway in the neck of the scale pit leading from the scale office to the pit. The door or hatch in the scale office is placed so that it does not interfere with a person operating the weighbeam.

Lighting is provided by electric lights permanently installed in the scale pit or by means of an extension light plugging into an outlet in the scale pit.

The livestock scale as a whole should be roofed over. The requirements in this respect will vary with local conditions. In localities where the weather is mild, simple protective structures will suffice, whereas in other places long winters with wind, rain, snow, and sleet require that the scale be placed in an extended structure. Frequently in such localities, the yards are roofed over and closed in at the sides. In such cases, the scale and scale house may be a part of the structure or a separate construction below.

